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Indoor Air Quality (IAQ) Upgrade Package

An Added Value Opportunity

For Discussion Purposes Only
***for* the Super E™ House Program**

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Introduction

As customers become more and more aware of the impacts of poor indoor air quality on home-owner health, allergies and comfort, the ability to offer clients an "Indoor Air Quality Upgrade" package becomes a true marketing advantage for builders. With minimal effort, a builder/manufacturer can create a package that provides clients with a healthier house at minimal costs. Most elements of the package offer much more than improved indoor air quality (IAQ), and hence have broad market appeal. Builders/manufacturers who position themselves to offer such packages can differentiate themselves from the competition and will be positioned to take advantage of a demand from home owners that will only be getting larger in the future.

Fundamental Elements of Improved IAQ

The following is the order of importance when developing an IAQ upgrade package:

1. ELIMINATE: the first step is to completely remove known indoor pollutants from the interior of the living space by replacing troublesome materials with alternative ones;

2. SEPARATE: where materials cannot be eliminated, separating them from the living space can be achieved by sealing surfaces of materials;

Note: With steps 1 and 2, target those elements with the largest surface area—material emissions tend to be directly related to surface area.

3. VENTILATE: finally, once all efforts have been made to prevent pollutants from degrading IAQ, a good ventilation system will dilute any remaining offenders, introducing fresh air to the living space while exhausting stale air from high pollutant areas.

Introduction

À mesure que les consommateurs prennent conscience des conséquences de la piètre qualité de l'air intérieur, laquelle peut entraîner des problèmes de santé, des allergies et de l'inconfort chez les occupants d'une maison, la capacité d'offrir à leurs clients un ensemble pour l'amélioration de la qualité de l'air intérieur constitue un réel avantage commercial pour les constructeurs. En faisant le minimum d'efforts, un constructeur ou un fabricant peut se créer un ensemble lui permettant d'offrir à ses clients une habitation salubre à moindres frais. La plus grande partie des éléments de ce genre d'ensemble permet non seulement d'améliorer la qualité de l'air intérieur, mais présente également un grand intérêt pour les marchés. Les constructeurs et les fabricants qui optent pour ces ensembles se retrouvent en bonne position pour se démarquer de la concurrence. Ils seront en mesure de profiter de la demande faite par les propriétaires de demeures, demande qui ne pourra que croître à l'avenir.

Principaux éléments de l'amélioration de la qualité de l'air intérieur

On trouvera ci-après les éléments, classés par ordre d'importance, inclus dans l'élaboration d'un ensemble servant à améliorer la qualité de l'air intérieur :

1. ÉLIMINER : La première étape consiste à éliminer entièrement les polluants à l'intérieur des espaces habitables en remplaçant les matériaux problématiques par d'autres.

2. SÉPARER : S'il s'avère impossible d'éliminer certains matériaux, on peut arriver à les séparer des espaces habitables en scellant la surface de ceux-ci.

Nota : Dans le cas des étapes 1 et 2, tâchez de vous concentrer sur les éléments relatifs aux plus grandes superficies. Les émissions provenant des matériaux ont habituellement un rapport direct avec les superficies.

3. VENTILER : Après avoir pris toutes les mesures pour empêcher les polluants de provoquer la dégradation de l'air intérieur, le recours à un bon système de ventilation va permettre d'atténuer les effets des autres produits nocifs. Il sera alors possible de faire pénétrer de l'air frais dans les espaces habitables tout en laissant évacuer l'air confiné des secteurs à forte concentration de polluants

Simple Steps to Improved IAQ

The R-2000 Technical Requirements have a specific section on improved IAQ. The R-2000 Technical Requirements' Section 8 (attached) has eight measures that if followed and supplemented with a good ventilation system will ensure good air quality—this can be used to provide a good initial IAQ upgrade package. Also attached is the R-2000 procurement list which provides a preliminary list of manufacturers of products that meet the R-2000 requirements—please note that this list is not comprehensive and is in no way an endorsement of any specific product or company; it merely provides a starting point for those looking for healthy materials.

Following the three fundamental elements listed above, and referencing the R-2000 Technical Requirements, the following are simple steps to creating an IAQ upgrade package:

1. ELIMINATE:

a) Carpet: Carpet is a pollutant "sink" that traps pollutants and releases them slowly over time. Carpet backing, underpadding and adhesives are also often primary sources of pollutants. Eliminating or minimizing carpetted area is therefore desirable. Carpet should be replaced with hard surface flooring (which can be covered with area rugs by home owners, if desired—area rugs are easier to clean and replace).

b) Vinyl Sheet Flooring: Vinyl sheet flooring is the largest producer of VOCs (volatile organic compounds) in a typical house and should be eliminated.

Flooring Alternatives:

- hardwood flooring
- softwood flooring
- laminate wood flooring
- ceramic tile
- vinyl composite tile
- cork
- marble
- linoleum

c) Particleboard Underlayment: Particleboard should meet specific requirements for formaldehyde content or should be sealed with an approved sealer (see *Separate* below) or should be replaced with an alternative material.

d) Particleboard in Cabinets: Cabinets that do not use particleboard should be selected (e.g. use solid wood), or particleboard meeting specific requirements should be used, or exposed surfaces should be sealed (see *Separate* below).

Particleboard Requirements:
- E-12 European standard
- HUD standard
- ANSI A208.1-1993

2. SEPARATE:

1) Building Envelope: Separating the indoor space from the outdoor space provides a controllable living space that can keep out outdoor pollutants. The good practice of building an airtight envelope to R-2000 standards therefore has IAQ benefits in addition to its energy and comfort advantages.

2) Paints and Varnishes: All liquid coatings used indoors except on wood floors should be water-based, interior type, or meet the Environmental Choice standards.

3) Wood Floor Finishes: All liquid coatings on wood flooring should meet Environmental Choice standards or be prefinished.

4) Sealants: Sealants used on particleboard or other offgasing materials should be Environmental choice approved or be low-toxicity sealers.

3. VENTILATE:

1) Air Exchanger: A properly installed and ducted air exchanger (e.g. HRV or ERV) ensures continuous supply of fresh air and exhaust of stale air. Further, proper installation also ensures that this fresh air is delivered directly to specific living areas and that stale or humid air is exhausted from high pollutant and wet areas. The use of an Energy Recovery Ventilator (ERV) can also allow improved control of indoor humidity levels. HRVs and ERVs can likely be more easily sold for their IAQ merits than their energy advantages—all new housing should be constructed with proper ventilation, whether the house is R-2000 or not.

2) Filtration: The installation of a ventilation system also allows for the filtration of the air. Houses without forced-air systems can achieve this filtration with the HRV/ERV. Houses with forced air systems should provide a furnace filter of at least medium efficiency with a minimum 10% ASHRAE average dust spot efficiency.

Note: Manufacturers with products meeting the above criteria (i.e. those listed in the R-2000 technical requirements) can be found in the attached R-2000 Procurement List.

Final Comments

Once compiled, an IAQ upgrade package is a simple but sure-to-be-popular addition to a builder's/manufacturer's repertoire. Little (if any) extra cost is necessary, as substitute materials need not be more expensive than those they replace. This is particularly true where wood floors and non-vinyl flooring are already the aesthetic preference of the customer. IAQ issues are becoming more and more important to home buyers—the opportunity for the progressive builder is obvious.

Other References

The following publications list specific products meeting good IAQ standards:

Canada Mortgage and Housing Corporation (1995). Building Material for the Environmentally Hypersensitive. Canada Mortgage and Housing Corporation, Ottawa, Ontario.

Rousseau, David and Kim LeClair (1992). Environmental By Design. Hartley and Marks, Vancouver, B.C.

The following publication lists generic products for meeting good IAQ standards:

Energy Pathways (1994). Environmental Choices for Home Builders and Renovators. Canadian Home Builders' Association, Ottawa, Ontario.

R-2000 requires that 2 of the elements listed in Section 8 be used to improve IAQ. If all are used, a ventilation credit is given, facilitating meeting the R-2000 energy budget. ***In the case of creating an IAQ Upgrade Package, it is recommended that all of the requirements listed in Section 8 be met.***

R-2000 HOME PROGRAM TECHNICAL REQUIREMENTS:SECTION 8

8. INDOOR AIR QUALITY

i) Carpeting; carpeting (except as noted) shall be labelled under the Canadian Carpet Institute's Green Label Program and shall cover no more than 50% of the interior floor area. The interior floor area includes the basement floor area. The following floor coverings are exempt: wool or cotton area rugs, and carpeting that has latex-free backing. These (exempt) floor coverings shall not be glued to the floor and cannot have underpads.

ii) Air filtration; a medium efficiency air filter with a minimum 10% ASHRAE average dust spot efficiency shall be installed where air circulating heating, cooling or heat recovery ventilation systems are used.

iii) Paints and Varnishes; all liquid coatings used indoors except on wood floors, are to be water based, interior type or meet or exceed Environment Canada Environmental Choice standards. Prefinished items are allowed.

iv) Flooring Adhesives; all finish flooring adhesives to be either water dispersion, low toxicity formulations or pre-adhesive types.

v) Kitchen cabinets and bathroom vanities; cabinets and vanities shall be solid wood or if made from manufactured wood products shall be made from formaldehyde-free fibre board; or particleboard meeting the E-1 European standard of the HUD Standard, 24 CFR Part 3280.308; or have all exposed surfaces sealed with an Environmental Choice approved sealer or a low toxicity sealer.

vi) Wood flooring; all liquid coatings used on wood flooring shall meet or exceed Environment Canada Environmental Choice standards (for paints) or be prefinished.

vii) Vinyl flooring; all vinyl flooring shall be either linoleum or synthetic vinyl tile. Sheet vinyl flooring shall not be used.

viii) Particleboard Underlayment; all particleboard flooring underlayment shall meet the E-1 European standard or the ANSI A208.1-1993 Table B standard; or have all surfaces sealed with an Environmental Choice approved sealer or a low toxicity sealer; or be prefinished.